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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/708,508	03/09/2004	Arup Gangopadhyay	81071965 FMC 1614 PUS	2507
28395	7590	07/26/2005	EXAMINER	
BROOKS KUSHMAN P.C./FGTL 1000 TOWN CENTER 22ND FLOOR SOUTHFIELD, MI 48075-1238			LE, DAVID D	
			ART UNIT	PAPER NUMBER
			3681	

DATE MAILED: 07/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/708,508	Applicant(s) GANGOPADHYAY ET AL.	
	Examiner David D. Le	Art Unit 3681	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>03/09/04, 03/26/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This is the first Office action on the merits of Application No. 10/708,508, filed on 09 March 2004. Claims 1-6 are pending.

Documents

2. The following documents have been received and filed as part of the patent application:
 - Information Disclosure Statement, received on 03/09/04
 - Information Disclosure Statement, received on 03/26/04

Specification

3. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required:
4. Claim 1 recites the limitation “axle efficiency”. There is insufficient antecedent basis in the present specification for this claimed limitation.

Claim Objections

5. Claim 1 is objected to because of the following informalities:
 - Claim 1, lines 11-12, “a higher axle efficiency” should be --a higher fuel efficiency--.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. **Claims 1-4 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.**

Claims 1-4:

- Claim 1, line 9 recites the term "a low surface roughness". This is a relative term, which renders the claim indefinite. The term "low surface roughness" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. The present specification, i.e., paragraph [0019], discloses an average surface roughness of 4-7 microinches. It is not clear which specific value or range of values is considered as low surface roughness.
- Claim 1, lines 11-12 recites the term "a higher axle efficiency". This is a relative term, which renders the claim indefinite. The term "higher axle efficiency" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

- Claim 2 recites the term "a mirror finish". This is a relative term, which renders the claim indefinite. The term "mirror finish" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. **Claims 1-4 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japanese Patent No JP 63007221 (JP'221) in view of U. S. Patent Application Publication No. US 2002/0088773 to Holland et al.**

Claims 1-4 and 6:

JP'221 (i.e., Figs. 3-4 and the abstract) discloses a differential gear set comprising:

- A pinion gear (1) connected to a drive shaft (i.e., Fig. 3);
- Wherein the pinion gear includes a plurality of teeth (i.e., Fig. 3);
- A ring gear (2) connected to the rear axle (7) and having a plurality of teeth that are engaged by the teeth of the pinion gear (i.e., Fig. 3); and

- Wherein the gears and their teeth are subjected to a gear surface treating, resulting in low surface roughness of the gear (i.e., abstract).

JP'221, abstract, does not explicitly disclose the teeth of the ring gear and the teeth of the pinion gear are super-finished to a low surface roughness.

Holland (i.e., paragraphs [0020] to [0025]), on the other hand, teaches a gear surface being super-finished by the superfinished process utilizing a bowl containing ceramic media and acid solution; wherein the superfinished gears, as taught by Holland, inherently provide low surface roughness and improve fuel efficiency.

Since Holland does not disclose/mention a break-in coating, Examiner assumes the superfinished gears are not provided with a break-in coating.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify *JP'221* such that the gear surface treating is the gear surface superfinished process, in view of Holland, in order to improve the performance as well as the life span of the gears (see Holland, paragraphs [0001] to [0002]).

Note:

The method of super-finishing the gear surface is not germane to the issue of patentability of the device itself. Therefore, these limitations have not been given patentable weight.

10. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP'221 in view of Holland et al. as applied to claims 1-4 and 6 above, and further in view of U. S. Patent No. 6,732,606 to Zhu et al.

Claim 5:

JP'221 in view of Holland et al. discloses the limitations as set forth above.

Regarding claim 5, *JP'221* lacks:

- Wherein the surface finish has an average roughness of 4-7 microinches.

Zhu (i.e., column 4, lines 11-12), on the other hand, discloses an optimally finished gear having a surface roughness of 5-10 microinches.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to further modify *JP'221* such that the surfaces of the superfinished gears include a surface roughness of 5-10 microinches, in view of *Zhu*, in order to further improve the gear performance (see *Zhu*, column 2, lines 13-48).

Note:

The method of super-finishing the gear surface is not germane to the issue of patentability of the device itself. Therefore, these limitations have not been given patentable weight.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Michaud et al. (U. S. Patent No. 4,491,500) teaches a method for refinement of metal surfaces using acidic solution and ceramic media.
- Hashimoto (U. S. Patent No. 5,873,770) teaches a vibratory finishing process to produce superfinished surfaces of workpieces.
- Semones et al. (U. S. Patent No. 3,979,858) teaches a chemically accelerated metal finishing process using acidic solution and ceramic media.

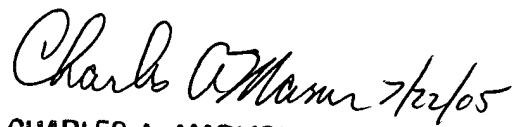
Any inquiry concerning this communication or earlier communications from the examiner should be directed to David D. Le whose telephone number is 571-272-7092. The examiner can normally be reached on Mon-Fri (0700-1530).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Charles A. Marmor can be reached on 571-272-7095. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 3681

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


ddl


CHARLES A. MARMOH
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ART UNIT 3681